

## Water Governance Benchmarking Criteria

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### **A. GOVERNANCE FUNCTIONS**

- 1. Organizing and building capacity in the water sector**
  - 1.1 Creating and modifying an organizational structure
  - 1.2 Assigning roles and responsibilities
  - 1.3 Setting national water policy
  - 1.4 Establishing linkages among sub-sectors, levels, and national sub-regions
  - 1.5 Establishing linkages with neighboring riparian countries
  - 1.6 Building public and political awareness of water sector issues
  - 1.7 Securing and allocating funding for the sector
  - 1.8 Developing and utilizing well-trained water sector professionals
- 2. Planning strategically**
  - 2.1 Collecting, managing, storing and utilizing water-relevant data **1**
  - 2.2 Projecting future supply and demand for water
  - 2.3 Designing strategies for matching expected long-term water supply an demand and dealing with shortfalls (including drought mitigation strategies)
  - 2.4 Developing planning and management tools to support decision making
- 3. Allocating water**
  - 3.1 Awarding and recording water rights and corollary responsibilities
  - 3.2 Establishing water and water rights transfer mechanisms
  - 3.3 Adjudicating disputes
  - 3.4 Assessing and managing third party impacts of water and water rights transactions
- 4. Developing and managing water resources**
  - 4.1 Constructing public infrastructure and authorizing private infrastructure development
  - 4.2 Forecasting seasonal supply and demand and matching the two
  - 4.3 Operating and maintaining public infrastructure according to established plans and strategic priorities
  - 4.4 Applying incentives and sanctions to achieve long and short term supply/demand matching (including water pricing)
  - 4.5 Forecasting and managing floods and flood impacts
- 5. Regulating water resources and services**
  - 5.1 Issuing and monitoring operating concessions to water service providers
  - 5.2 Enforcing withdrawal limits associated with water rights
  - 5.3 Regulating water quality in waterways, water bodies, and aquifers (including enforcement) **2**
  - 5.4 Protecting aquatic ecosystems
  - 5.5 Monitoring and enforcing water service standards **3**

## **B. GOVERNANCE PROCESS CHARACTERISTICS**

- 1. Transparency.**
- 2. Participation.**
- 3. Accountability and Integrity.** 4, 5, 6, 7
- 4. Rule of law.**
- 5. Coherency and Integration.**
- 6. Responsiveness.**

## **C. CROSS CUTTING CATEGORIES**

- 1. Water Sources**
  - 1.1 Surface water
  - 1.2 Groundwater
  - 1.3 Derivative water (reclaimed, reused, desalinated)
- 2. Water Uses**
  - 2.1 Irrigation
  - 2.2 Municipal 8
  - 2.3 Industrial
  - 2.4 Environmental
  - 2.5 Hydropower
  - 2.6 Fisheries, navigation, recreation
  - 2.7 Other uses (including social, esthetic, and religious uses)

## Jordanian Drinking Water Standards JS 286/1997 2, 3, 8

Content:

- I. Scope
- II. Definitions
- III. Standards
- IV. Quality Monitoring
- V. Sampling and Analysis

### **I. Scope**

This document identifies the biological, physical and chemical Parameters and conditions for drinking water.

### **II. Definitions**

Drinking water is defined as potable water used for domestic purposes, food industries, and ice manufacturing.

### **III. Standard conditions**

#### **III.1 Microbial Parameters**

III.1.1 The maximum allowable limit for the TCC (MPN/100ml) should be < 1.1 as a result of the Multiple Tube Test and 0 as result of the Membrane Filtration Test

III.1.2 The sample should be free from

- a) Thermo tolerant coli form bacteria, and
- b) Enteric viruses and germs

#### **III.2 Biological Parameters**

Drinking water should be free from

- a) Any pathogenic protozoa
- b) Any pathogenic nematode eggs
- c) Any free living pathogens, and
- d) Fungus

#### **III.3 Physical Characteristics**

The physical characteristics of water should be as follows:

- a) Taste: Acceptable for the majority of people
- b) Odor: Acceptable for the majority of people
- c) Color: The maximum allowable limit is 10 units –15 units
- d) Turbidity: The maximum allowable limits is 1 – 5 NTU

### III.4 Chemical Characteristics

III.4.1 Where chlorine is used to disinfect the drinking water, the maximum allowable limit for free chlorine supplied to the consumer is 0.2-1mg/l after 15 minutes from disinfection and 15 minutes before arriving to the consumer.

III.4.2 Parameters Related to Water Taste read as indicated in the following table. Note that the lower range level is obligatory for private wells.

Table 1: Parameters Related to Water Taste

Parameter (mg/l)	Maximum Allowable Limits
pH (SU)	6.5 - 8.5
TDS	< 500 - 1500
TH (CaCO <sub>3</sub> )	< 100 - 500
LAS (MBAS)*	< 0.2 - 0.5
NH <sub>4</sub>	0.5
Al	< 0.1 - 0.2
Mn	< 0.1 - 0.5
Fe	< 0.3 - 1.0
Cu	< 1.0 - 1.5
Zn	< 3 - 5
Na	< 200 - 400
Cl	< 200 - 500
Residual Chlorine 15 minutes After Addition of Chlorine	0.2 - 1.0
SO <sub>4</sub>	< 200 - 500
Color (PCU)	< 10 - 15
Turbidity (NTU)	< 1 - 5

\* LAS: Linear Alkyl Benzene Sulfonate  
MBAS: Methyl Alkyl Benzene Sulfonate

III.4.3 The parameters related to the concentrations of chemicals that have a direct impact in human health are listed in the table with their respective maximum allowable limit.

Table 2: Parameters that Affect Public Health:

Parameter (mg/l)	Maximum Allowable Limits
TCC (MPN/100ml) - Multiple Tube Test Membrane Filtration Test	< 1.1 0
TFCC (MPN/100ml)	0
As	0.01
Ba	0.7
Pb	0.01
Se	0.01
B	0.3
Cd	0.003
Cr	0.05
Cn	0.07
Hg	0.002
Ag	0.1
Ni	0.02
Sb	0.005
F	1.5
NO <sub>2</sub>	2
NO <sub>3</sub>	< 50 - 70
TTHM*	150 µg/l**

\* TTHM: Total Tri-Halo Methanes which include: chloroform, bromoform, bromo-di-chloro-methane, di-bromo-chloro-methane.

\*\* The maximum allowable limit at the end of the distribution network.-

III.4.4 Radioactive parameters: Radioactive material should not exceed the below indicated levels for drinking water.

Table 3: Radioactive Parameters.

Parameter (Bq/L)	Maximum Allowable Limit
Alpha Emitters	0.1
Beta Emitters	1

III.4.5 Organic Pollutants

III.4.5.1 The level of organic pollutants in drinking water should not exceed the indicated levels in the following table.

Table 4: Organic Pollutants. \*\*

Parameter* (mg/l)	Maximum Allowable Limit
Parathion	0.035
Endrin	0.0002
Lindane	0.004
Methoxy chlorine	0.1
Toxaphene	0.005
Malathion	0.19

Permethrine	0.002
Dimethoate	0.02
Diazinon	0.02
Hexachlorocyclohexane (BHC)	0.04
Chlorophenoxy Acids	
2,4 -Dichlorophenoxy Acetic Acid	0.1
2,4,5 -Trichlorophenoxy Propionic Acid	0.01

\* Total content of pesticides should not exceed 0.1 mg/l

III.4.5.2 For organic pollutants that are not mentioned in Table 2 WHO standards are applicable.

#### IV. Quality Monitoring: 1

Table 5: Monitoring Locations and Number of Samples.

No.	Location	Chemical and Physical Parameters		Microbiological Parameters
		Parameters that Affect Taste	Parameters that Affect Health	Coliforms and Heat Resistant Coliforms
1	Water Treatment Plants			
A	Groundwater Free of Fecal Contamination	1 sample / 6 months	1 sample / year	1 sample / month
B	Groundwater with Fecal Contamination	1 sample/ 6 months	1 sample / year	1 sample / day
C	Surface Water	1 sample / month	1 sample / month	1 sample / day
2	Water Reservoirs	1 sample/ 6 months		1 sample / week
3	Network Based on Served Population:			
	< 5000 persons	-	-	1 sample / month
	5,000 - 50,000 persons	-	-	1 sample /5,000 persons/ month
	> 50,000 persons	-	-	1 sample /10,000 persons / month Added to them 10 samples

- Monitoring for pathogenic bacteria, protozoa, and intestinal nematodes should be performed as needed.
- A source is considered polluted if two consecutive samples on two consecutive days after the first positive sample show the presence of coliforms or heat resistant coliforms.
- The source is considered polluted if any of the following pollutants is present: All phases of pathogenic protozoa, all phases of intestinal nematodes, living creatures, and fungi.
- If the pollution of a source is proven, pumping of water from that source should be stopped and the relevant authorities investigate into the reason or source of pollution and remove the pollutant. **4**
- Water source is used again after it is suitability for use proven for two consecutive days. **5**
- The samples that are not microbiologically fit should not exceed the following averages:
  - Source: 5% of total samples collected in 1 month.
  - Distribution System: 5% of the samples collected in 1 year. **6**

**V. Sample Collection and Test Methods: **7****

The following references are used for the sample collection and testing methods:

- Standard Methods for Examination of Water and Wastewater, American Public Health Association and its amendments.
- ISO - Environment - Water Quality Vol. 1, 2, & 3.